

SEQUENCE LISTING

<110> Simonet, William S.
Asuncion, Franklin J.
Min, Hosung
Jing, Shuqian

<120> GRNF4 A Neurotrophic Factor

<130> A-574PCT

<140> PCT/US99/28975

<141> 1999-12-08

<150> 60/111,626

<151> 1998-12-09

<160> 12

<170> PatentIn Ver. 2.1

<210> 1

<211> 378

<212> DNA

<213> Murine

<220>

<221> CDS

<222> (2)..(376)

<220>

<223> The amino acid Xaa in position #79 may be proline.
The amino acid Xaa in position #102 may be
tryptophan. The amino acid Xaa in position #118
and #120 can be any amino acid.

<400> 1

c gcg tgg gcg cgt gca gga acc cgg agc agc cgc gca cgg acc aca gat 49
Ala Trp Ala Arg Ala Gly Thr Arg Ser Ser Arg Ala Arg Thr Thr Asp
1 5 10 15

gcg cgc ggc tgc cgc ctg cgc tcg cag ctg gtg ccg gtg agt gcg ctc 97
Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Ser Ala Leu
20 25 30

ggc cta ggc cac agc tcc gac gag ctg ata cgt ttc cgc ttc tgc agc 145
Gly Leu Gly His Ser Ser Asp Glu Leu Ile Arg Phe Arg Phe Cys Ser
35 40 45

ggc tcg tgc cgt cga gca cgc tcc cag cac gat ctc agt ctg gcc agc 193
Gly Ser Cys Arg Arg Ala Arg Ser Gln His Asp Leu Ser Leu Ala Ser
50 55 60

cta ctg ggc gct ggg gcc cta cgg tcg cct ccc ggg tcc cgg ncg atc 241
Leu Leu Gly Ala Gly Ala Leu Arg Ser Pro Pro Gly Ser Arg Xaa Ile
65 70 75 80

agc cag ccc tgc tgc cgg ccc act cgc tat gag gcc gtc tcc ttc atg 289
 Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met
 85 90 95

gac gtg aac agc acc tgn agg acc gtg gac cac ctc tcc gcc act gcc 337
 Asp Val Asn Ser Thr Xaa Arg Thr Val Asp His Leu Ser Ala Thr Ala
 100 105 110

tgc ggc tgt ctg ggc nnn gga nnn tct atc tcc aag cct tt 378
 Cys Gly Cys Leu Gly Xaa Gly Xaa Ser Ile Ser Lys Pro
 115 120 125

<210> 2

<211> 125

<212> PRT

<213> Murine

<223> The amino acid Xaa in position #79 may be proline.
 The amino acid Xaa in position #102 may be
 tryptophan. The amino acid Xaa in position #118
 and #120 can be any amino acid.

<400> 2

Ala Trp Ala Arg Ala Gly Thr Arg Ser Ser Arg Ala Arg Thr Thr Asp
 1 5 10 15

Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Ser Ala Leu
 20 25 30

Gly Leu Gly His Ser Ser Asp Glu Leu Ile Arg Phe Arg Phe Cys Ser
 35 40 45

Gly Ser Cys Arg Arg Ala Arg Ser Gln His Asp Leu Ser Leu Ala Ser
 50 55 60

Leu Leu Gly Ala Gly Ala Leu Arg Ser Pro Pro Gly Ser Arg Xaa Ile
 65 70 75 80

Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met
 85 90 95

Asp Val Asn Ser Thr Xaa Arg Thr Val Asp His Leu Ser Ala Thr Ala
 100 105 110

Cys Gly Cys Leu Gly Xaa Gly Xaa Ser Ile Ser Lys Pro
 115 120 125

<210> 3

<211> 143

<212> PRT

<213> Murine

<220>

<223> neurturin mouse

<400> 3

Arg Leu Ala Gln Tyr Arg Ala Leu Leu Gln Gly Ala Pro Asp Ala Val
1 5 10 15
Glu Leu Arg Glu Leu Ser Pro Trp Ala Ala Arg Ile Pro Gly Pro Arg
20 25 30
Arg Arg Ala Gly Pro Arg Arg Arg Arg Ala Arg Pro Gly Ala Arg Pro
35 40 45
Cys Gly Leu Arg Glu Leu Glu Val Arg Val Ser Glu Leu Gly Leu Gly
50 55 60
Tyr Thr Ser Asp Glu Thr Val Leu Phe Arg Tyr Cys Ala Gly Ala Cys
65 70 75 80
Glu Ala Ala Ile Arg Ile Tyr Asp Leu Gly Leu Arg Arg Leu Arg Gln
85 90 95
Arg Arg Arg Val Arg Arg Glu Arg Ala Arg Ala His Pro Cys Cys Arg
100 105 110
Pro Thr Ala Tyr Glu Asp Glu Val Ser Phe Leu Asp Val His Ser Arg
115 120 125
Tyr His Thr Leu Gln Glu Leu Ser Ala Arg Glu Cys Ala Cys Val
130 135 140

<210> 4

<211> 1054

<212> DNA

<213> Murine

<220>

<221> CDS

<222> (18)..(1052)

<220>

<223> The amino acid Xaa in any position can be any
amino acid

<400> 4

cggacgcgtg ggcggac gcg tgg gcg cgt gca gga acc cgg agc agc cgc 50
Ala Trp Ala Arg Ala Gly Thr Arg Ser Ser Arg
1 5 10
gca cgg acc aca gat gcg cgc ggc tgc cgc ctg cgc tgc cag ctg gtg 98
Ala Arg Thr Thr Asp Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val
15 20 25
ccg gtg agt gcg ctc ggc cta ggc cac agc tcc gac gag ctg ata cgt 146
Pro Val Ser Ala Leu Gly Leu Gly His Ser Ser Asp Glu Leu Ile Arg
30 35 40

ttc cgc ttc tgc agc ggc tgc tgc cgc cga gca cgc tcc cag cac gat	194
Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Gln His Asp	
45 50 55	
ctc agt ctg gcc agc cta ctg ggc gct ggg gcc cta cgg tgc cct ccc	242
Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Ser Pro Pro	
60 65 70 75	
ggg tcc cgg ccg atc agc cag ccc tgc tgc cgg ccc act cgc tat gag	290
Gly Ser Arg Pro Ile Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu	
80 85 90	
gcc gtc tcc ttc atg gac gtg aac agc acc tgg agg acc gtg gac cac	338
Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp His	
95 100 105	
ctc tcc gcc act gcc tgc ggc tgt ctg ggc nnn gga nnn tct atc tcc	386
Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly Xaa Gly Xaa Ser Ile Ser	
110 115 120	
aag cct ttg cac act aga ccc atg tgt tgc cct acc tgg aac agc tcc	434
Lys Pro Leu His Thr Arg Pro Met Cys Cys Pro Thr Trp Asn Ser Ser	
125 130 135	
acc ggg cct cac nnn cca gga gcc tca act cag cag gat atg gag gct	482
Thr Gly Pro His Xaa Pro Gly Ala Ser Thr Gln Gln Asp Met Glu Ala	
140 145 150 155	
gca gag ctc agg ccc cag gcc ggt gag nnn cag acg tgc tgc gca nnn	530
Ala Glu Leu Arg Pro Gln Ala Gly Glu Xaa Gln Thr Ser Ser Ala Xaa	
160 165 170	
cag aca gag nnn aag atg tgc gaa cca ctg acc aac agt ccc aag ttg	578
Gln Thr Glu Xaa Lys Met Ser Glu Pro Leu Thr Asn Ser Pro Lys Leu	
175 180 185	
ttc atg gat cac agc tct aca gac agg aga aac ctc agc nnn aga gaa	626
Phe Met Asp His Ser Ser Thr Asp Arg Arg Asn Leu Ser Xaa Arg Glu	
190 195 200	
ctc ctc tgg gag aat cca gaa atg gcc ctc tgt cct ggg gaa nnn att	674
Leu Leu Trp Glu Asn Pro Glu Met Ala Leu Cys Pro Gly Glu Xaa Ile	
205 210 215	
ttg aag aga tat ata tac ata tat aca ttg nnn tgc cgt tgc tgg acc	722
Leu Lys Arg Tyr Ile Tyr Ile Tyr Thr Leu Xaa Ser Arg Cys Trp Thr	
220 225 230 235	
agc ctg tgc nnn aac cag tcc cgt gtt cac ttg tgg aag ccg aag ccc	770
Ser Leu Cys Xaa Asn Gln Ser Arg Val His Leu Trp Lys Pro Lys Pro	
240 245 250	
tat tta tta ttt cta aat tat tta ttt act ttg ctg gtt tgt cag atc	818
Tyr Leu Leu Phe Leu Asn Tyr Leu Phe Thr Leu Leu Val Cys Gln Ile	
255 260 265	

ctt tcc tgg aca tgg ggg atg gta gaa gaa gct aga nnn aga tgt gcc 866
 Leu Ser Trp Thr Trp Gly Met Val Glu Glu Ala Arg Xaa Arg Cys Ala
 270 275 280

cca ccc cac ccc ccc atc cac att tta cac ttg act cag nnn tgc tac 914
 Pro Pro His Pro Pro Ile His Ile Leu His Leu Thr Gln Xaa Cys Tyr
 285 290 295

ctg gat cgc cta ctt ctt gcc ccg cag gtg tct ctg aga tgg atg gga 962
 Leu Asp Arg Leu Leu Leu Ala Pro Gln Val Ser Leu Arg Trp Met Gly
 300 305 310 315

ggc aca cat agg nnn caa aga tgc aca atc cac agt act tgg ggc ctg
 1010
 Gly Thr His Arg Xaa Gln Arg Cys Thr Ile His Ser Thr Trp Gly Leu
 320 325 330

ggg tac cta tgg gaa ata aac aat ata gtt ttc tat gga aaa aa
 1054
 Gly Tyr Leu Trp Glu Ile Asn Asn Ile Val Phe Tyr Gly Lys
 335 340 345

<210> 5

<211> 345

<212> PRT

<213> Murine

<223> The amino acid Xaa in any position can be any
 amino acid

<400> 5

Ala Trp Ala Arg Ala Gly Thr Arg Ser Ser Arg Ala Arg Thr Thr Asp
 1 5 10 15

Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val Pro Val Ser Ala Leu
 20 25 30

Gly Leu Gly His Ser Ser Asp Glu Leu Ile Arg Phe Arg Phe Cys Ser
 35 40 45

Gly Ser Cys Arg Arg Ala Arg Ser Gln His Asp Leu Ser Leu Ala Ser
 50 55 60

Leu Leu Gly Ala Gly Ala Leu Arg Ser Pro Pro Gly Ser Arg Pro Ile
 65 70 75 80

Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met
 85 90 95

Asp Val Asn Ser Thr Trp Arg Thr Val Asp His Leu Ser Ala Thr Ala
 100 105 110

Cys Gly Cys Leu Gly Xaa Gly Xaa Ser Ile Ser Lys Pro Leu His Thr
 115 120 125

Arg	Pro	Met	Cys	Cys	Pro	Thr	Trp	Asn	Ser	Ser	Thr	Gly	Pro	His	Xaa
130						135					140				
Pro	Gly	Ala	Ser	Thr	Gln	Gln	Asp	Met	Glu	Ala	Ala	Glu	Leu	Arg	Pro
145					150				155						160
Gln	Ala	Gly	Glu	Xaa	Gln	Thr	Ser	Ser	Ala	Xaa	Gln	Thr	Glu	Xaa	Lys
			165						170					175	
Met	Ser	Glu	Pro	Leu	Thr	Asn	Ser	Pro	Lys	Leu	Phe	Met	Asp	His	Ser
			180					185					190		
Ser	Thr	Asp	Arg	Arg	Asn	Leu	Ser	Xaa	Arg	Glu	Leu	Leu	Trp	Glu	Asn
		195					200					205			
Pro	Glu	Met	Ala	Leu	Cys	Pro	Gly	Glu	Xaa	Ile	Leu	Lys	Arg	Tyr	Ile
210						215					220				
Tyr	Ile	Tyr	Thr	Leu	Xaa	Ser	Arg	Cys	Trp	Thr	Ser	Leu	Cys	Xaa	Asn
225				230						235					240
Gln	Ser	Arg	Val	His	Leu	Trp	Lys	Pro	Lys	Pro	Tyr	Leu	Leu	Phe	Leu
			245						250					255	
Asn	Tyr	Leu	Phe	Thr	Leu	Leu	Val	Cys	Gln	Ile	Leu	Ser	Trp	Thr	Trp
		260						265					270		
Gly	Met	Val	Glu	Glu	Ala	Arg	Xaa	Arg	Cys	Ala	Pro	Pro	His	Pro	Pro
		275					280					285			
Ile	His	Ile	Leu	His	Leu	Thr	Gln	Xaa	Cys	Tyr	Leu	Asp	Arg	Leu	Leu
290						295					300				
Leu	Ala	Pro	Gln	Val	Ser	Leu	Arg	Trp	Met	Gly	Gly	Thr	His	Arg	Xaa
305				310						315					320
Gln	Arg	Cys	Thr	Ile	His	Ser	Thr	Trp	Gly	Leu	Gly	Tyr	Leu	Trp	Glu
			325						330					335	
Ile	Asn	Asn	Ile	Val	Phe	Tyr	Gly	Lys							
		340						345							

<210> 6
 <211> 1013
 <212> DNA
 <213> Murine

<220>
 <221> CDS
 <222> (217)..(891)

<400> 6
 ccaagcttgg taccgagctc ggatccacta gtaacggccg ccagtgtgct ggaattcgcc 60

cttactcact atagggctcg agcggccgcc cgggcaggta taaaaaaaaa aagcggccta	120
gaattcagcg gccgctgaat tctaggctgc cgcaggaaga ggggtggggaa acgggtccac	180
gaaggcttct gatgggagct tctggagccg aaagct atg gaa ctg gga ctt gca	234
Met Glu Leu Gly Leu Ala	
1 5	
gag cct act gca ttg tcc cac tgc ctc cgg cct agg tgg cag tca gcc	282
Glu Pro Thr Ala Leu Ser His Cys Leu Arg Pro Arg Trp Gln Ser Ala	
10 15 20	
tgg tgg cca acc cta gct gtt cta gcc ctg ctg agc tgc gtc aca gaa	330
Trp Trp Pro Thr Leu Ala Val Leu Ala Leu Leu Ser Cys Val Thr Glu	
25 30 35	
gct tcc ctg gac cca atg tcc cgc agc ccc gcc gct cgc gac ggt ccc	378
Ala Ser Leu Asp Pro Met Ser Arg Ser Pro Ala Ala Arg Asp Gly Pro	
40 45 50	
tca ccg gtc ttg gcg ccc ccc acg gac cac ctg cct ggg gga cac act	426
Ser Pro Val Leu Ala Pro Pro Thr Asp His Leu Pro Gly Gly His Thr	
55 60 65 70	
gcg cat ttg tgc agc gaa aga acc ctg cga ccc ccg cct cag tct cct	474
Ala His Leu Cys Ser Glu Arg Thr Leu Arg Pro Pro Pro Gln Ser Pro	
75 80 85	
cag ccc gca ccc ccg ccg cct ggt ccc gcg ctc cag tct cct ccc gct	522
Gln Pro Ala Pro Pro Pro Pro Gly Pro Ala Leu Gln Ser Pro Pro Ala	
90 95 100	
gcg ctc cgc ggg gca cgc gcg gcg cgt gca gga acc ccg agc agc cgc	570
Ala Leu Arg Gly Ala Arg Ala Ala Arg Ala Gly Thr Arg Ser Ser Arg	
105 110 115	
gca ccg acc aca gat gcg cgc ggc tgc cgc ctg cgc tcg cag ctg gtg	618
Ala Arg Thr Thr Asp Ala Arg Gly Cys Arg Leu Arg Ser Gln Leu Val	
120 125 130	
ccg gtg agc gcg ctc ggc cta ggc cac agc tcc gac gag ctg ata cgt	666
Pro Val Ser Ala Leu Gly Leu Gly His Ser Ser Asp Glu Leu Ile Arg	
135 140 145 150	
ttc cgc ttc tgc agc ggc tcg tgc cgc cga gca cgc tcc cag cac gat	714
Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg Ser Gln His Asp	
155 160 165	
ctc agt ctg gcc agc cta ctg ggc gct ggg gcc cta ccg tcg cct ccc	762
Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu Arg Ser Pro Pro	
170 175 180	
ggg tcc ccg ccg atc agc cag ccc tgc tgc ccg ccc act cgc tat gag	810
Gly Ser Arg Pro Ile Ser Gln Pro Cys Cys Arg Pro Thr Arg Tyr Glu	
185 190 195	

gcc gtc tcc ttc atg gac gtg aac agc acc tgg agg acc gtg gac cac 858
 Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg Thr Val Asp His
 200 205 210

ctc tcc gcc act gcc tgc ggc tgt ctg ggc tga ggatgatcta tctccaagcc 911
 Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
 215 220 225

tttgcacact agacccatgt gttgccctac ctggaacagc tccaagggcg aattctgcag 971

atatccatca cactggcggc cgctcgagca tgcattctaga gg
 1013

<210> 7
 <211> 224
 <212> PRT
 <213> Murine

<400> 7
 Met Glu Leu Gly Leu Ala Glu Pro Thr Ala Leu Ser His Cys Leu Arg
 1 5 10 15
 Pro Arg Trp Gln Ser Ala Trp Trp Pro Thr Leu Ala Val Leu Ala Leu
 20 25 30
 Leu Ser Cys Val Thr Glu Ala Ser Leu Asp Pro Met Ser Arg Ser Pro
 35 40 45
 Ala Ala Arg Asp Gly Pro Ser Pro Val Leu Ala Pro Pro Thr Asp His
 50 55 60
 Leu Pro Gly Gly His Thr Ala His Leu Cys Ser Glu Arg Thr Leu Arg
 65 70 75 80
 Pro Pro Pro Gln Ser Pro Gln Pro Ala Pro Pro Pro Gly Pro Ala
 85 90 95
 Leu Gln Ser Pro Pro Ala Ala Leu Arg Gly Ala Arg Ala Ala Arg Ala
 100 105 110
 Gly Thr Arg Ser Ser Arg Ala Arg Thr Thr Asp Ala Arg Gly Cys Arg
 115 120 125
 Leu Arg Ser Gln Leu Val Pro Val Ser Ala Leu Gly Leu Gly His Ser
 130 135 140
 Ser Asp Glu Leu Ile Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg
 145 150 155 160
 Ala Arg Ser Gln His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly
 165 170 175
 Ala Leu Arg Ser Pro Pro Gly Ser Arg Pro Ile Ser Gln Pro Cys Cys
 180 185 190
 Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr
 195 200 205
 Trp Arg Thr Val Asp His Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly
 210 215 220

<210> 8
 <211> 240
 <212> PRT
 <213> Murine

<220>

<223> GDNF

<400> 8

Met	Gly	Phe	Gly	Pro	Leu	Gly	Val	Asn	Val	Gln	Leu	Gly	Val	Tyr	Gly	
1				5					10					15		
Asp	Arg	Ile	Arg	Gly	Ala	Ala	Ala	Gly	Arg	Asp	Ser	Lys	Met	Lys	Leu	
			20					25					30			
Trp	Asp	Val	Val	Ala	Val	Cys	Leu	Val	Leu	Leu	His	Thr	Ala	Ser	Ala	
		35					40					45				
Phe	Pro	Leu	Pro	Ala	Gly	Lys	Arg	Leu	Leu	Glu	Ala	Pro	Ala	Glu	Asp	
	50					55					60					
His	Ser	Leu	Gly	His	Arg	Arg	Val	Pro	Phe	Ala	Leu	Thr	Ser	Asp	Ser	
65					70					75					80	
Asn	Met	Pro	Glu	Asp	Tyr	Pro	Asp	Gln	Phe	Asp	Asp	Val	Met	Asp	Phe	
				85					90					95		
Ile	Gln	Ala	Thr	Ile	Lys	Arg	Leu	Lys	Arg	Ser	Pro	Asp	Lys	Gln	Ala	
			100					105					110			
Ala	Ala	Leu	Pro	Arg	Arg	Glu	Arg	Asn	Arg	Gln	Ala	Ala	Ala	Ala	Ser	
		115					120					125				
Pro	Glu	Asn	Ser	Arg	Gly	Lys	Gly	Arg	Arg	Gly	Gln	Arg	Gly	Lys	Asn	
	130					135					140					
Arg	Gly	Cys	Val	Leu	Thr	Ala	Ile	His	Leu	Asn	Val	Thr	Asp	Leu	Gly	
145					150					155					160	
Leu	Gly	Tyr	Glu	Thr	Lys	Glu	Glu	Leu	Ile	Phe	Arg	Tyr	Cys	Ser	Gly	
				165					170					175		
Ser	Cys	Glu	Ser	Ala	Glu	Thr	Met	Tyr	Asp	Lys	Ile	Leu	Lys	Asn	Leu	
			180					185					190			
Ser	Arg	Ser	Arg	Arg	Leu	Thr	Ser	Asp	Lys	Val	Gly	Gln	Ala	Cys	Cys	
		195					200					205				
Arg	Pro	Val	Ala	Phe	Asp	Asp	Asp	Leu	Ser	Phe	Leu	Asp	Asp	Asn	Leu	
	210					215						220				
Val	Tyr	His	Ile	Leu	Arg	Lys	His	Ser	Ala	Lys	Arg	Cys	Gly	Cys	Ile	
225					230					235					240	

<210> 9

<211> 156

<212> PRT

<213> Murine

<220>

<223> persephin

<400> 9

Met Ala Ala Gly Arg Leu Arg Ile Leu Cys Leu Leu Leu Leu Ser Leu
1 5 10 15

His Pro Ser Leu Gly Trp Val Leu Asp Leu Gln Glu Ala Ser Val Ala
20 25 30

Asp Lys Leu Ser Phe Gly Lys Met Ala Glu Thr Arg Gly Thr Trp Thr
35 40 45

Pro His Gln Gly Asn Asn His Val Arg Leu Pro Arg Ala Leu Ala Gly
50 55 60

Ser Cys Arg Leu Trp Ser Leu Thr Leu Pro Val Ala Glu Leu Gly Leu
65 70 75 80

Gly Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala Gly Ser
85 90 95

Cys Pro Gln Glu Ala Arg Thr Gln His Ser Leu Val Leu Ala Arg Leu
100 105 110

Arg Gly Arg Gly Arg Ala His Gly Arg Pro Cys Cys Gln Pro Thr Ser
115 120 125

Tyr Ala Asp Val Thr Phe Leu Asp Asp Gln His His Trp Gln Gln Leu
130 135 140

Pro Gln Leu Ser Ala Ala Ala Cys Gly Cys Gly Gly
145 150 155

<210> 10

<211> 736

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (38)..(721)

<400> 10

caacaatggc tgatgggcgc tcctggtggt gatagag atg gaa ctt gga ctt gga 55
Met Glu Leu Gly Leu Gly
1 5

ggc ctc tcc acg ctg tcc cac tgc ccc tgg cct agg cgg cag gct cca 103
Gly Leu Ser Thr Leu Ser His Cys Pro Trp Pro Arg Arg Gln Ala Pro
10 15 20

ctt ggt ctc tcc gcg cag cct gcc ctg tgg ccc acc ctg gcc gct ctg	151
Leu Gly Leu Ser Ala Gln Pro Ala Leu Trp Pro Thr Leu Ala Ala Leu	
25 30 35	
gct ctg ctg agc agc gtc gca gag gcc tcc ctg ggc tcc gcg ccc cgc	199
Ala Leu Leu Ser Ser Val Ala Glu Ala Ser Leu Gly Ser Ala Pro Arg	
40 45 50	
agc cct gcc ccc cgc gaa ggc ccc ccg cct gtc ctg gcg tcc ccc gcc	247
Ser Pro Ala Pro Arg Glu Gly Pro Pro Pro Val Leu Ala Ser Pro Ala	
55 60 65 70	
ggc cac ctg ccg ggg gga cgc acg gcc cgc tgg tgc agt gga aga gcc	295
Gly His Leu Pro Gly Gly Arg Thr Ala Arg Trp Cys Ser Gly Arg Ala	
75 80 85	
cgg cgg ccg ccg ccg cag cct tct cgg ccc gcg ccc ccg ccg cct gca	343
Arg Arg Pro Pro Pro Gln Pro Ser Arg Pro Ala Pro Pro Pro Pro Ala	
90 95 100	
ccc cca tct gct ctt ccc cgc ggg ggc cgc gcg gcg cgg gct ggg ggc	391
Pro Pro Ser Ala Leu Pro Arg Gly Gly Arg Ala Ala Arg Ala Gly Gly	
105 110 115	
ccg ggc agc cgc gct cgg gca gcg ggg gcg cgg ggc tgc cgc ctg cgc	439
Pro Gly Ser Arg Ala Arg Ala Ala Gly Ala Arg Gly Cys Arg Leu Arg	
120 125 130	
tcg cag ctg gtg ccg gtg cgc gcg ctc ggc ctg ggc cac cgc tcc gac	487
Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly His Arg Ser Asp	
135 140 145 150	
gag ctg gtg cgt ttc cgc ttc tgc agc ggc tcc tgc cgc cgc gcg cgc	535
Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys Arg Arg Ala Arg	
155 160 165	
tct cca cac gac ctc agc ctg gcc agc cta ctg ggc gcc ggg gcc ctg	583
Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly Ala Gly Ala Leu	
170 175 180	
cga ccg ccc ccg ggc tcc cgg ccc gtc agc cag ccc tgc tgc cga ccc	631
Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro Cys Cys Arg Pro	
185 190 195	
acg cgc tac gaa gca gtc tcc ttc atg gac gtc aac agc acc tgg aga	679
Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn Ser Thr Trp Arg	
200 205 210	
acc gtg gac cgc ctc tcc gcc acc gcc tgc ggc tgc ctg ggc	721
Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys Leu Gly	
215 220 225	
tgagggctcg ctcca	736

<210> 11
 <211> 228
 <212> PRT
 <213> Homo sapiens

<400> 11

Met	Glu	Leu	Gly	Leu	Gly	Gly	Leu	Ser	Thr	Leu	Ser	His	Cys	Pro	Trp
1				5					10					15	
Pro	Arg	Arg	Gln	Ala	Pro	Leu	Gly	Leu	Ser	Ala	Gln	Pro	Ala	Leu	Trp
			20					25					30		
Pro	Thr	Leu	Ala	Ala	Leu	Ala	Leu	Leu	Ser	Ser	Val	Ala	Glu	Ala	Ser
		35					40					45			
Leu	Gly	Ser	Ala	Pro	Arg	Ser	Pro	Ala	Pro	Arg	Glu	Gly	Pro	Pro	Pro
	50					55					60				
Val	Leu	Ala	Ser	Pro	Ala	Gly	His	Leu	Pro	Gly	Gly	Arg	Thr	Ala	Arg
65					70					75					80
Trp	Cys	Ser	Gly	Arg	Ala	Arg	Arg	Pro	Pro	Pro	Gln	Pro	Ser	Arg	Pro
				85					90					95	
Ala	Pro	Pro	Pro	Pro	Ala	Pro	Pro	Ser	Ala	Leu	Pro	Arg	Gly	Gly	Arg
			100					105					110		
Ala	Ala	Arg	Ala	Gly	Gly	Pro	Gly	Ser	Arg	Ala	Arg	Ala	Ala	Gly	Ala
		115					120					125			
Arg	Gly	Cys	Arg	Leu	Arg	Ser	Gln	Leu	Val	Pro	Val	Arg	Ala	Leu	Gly
	130					135					140				
Leu	Gly	His	Arg	Ser	Asp	Glu	Leu	Val	Arg	Phe	Arg	Phe	Cys	Ser	Gly
145					150					155					160
Ser	Cys	Arg	Arg	Ala	Arg	Ser	Pro	His	Asp	Leu	Ser	Leu	Ala	Ser	Leu
				165					170					175	
Leu	Gly	Ala	Gly	Ala	Leu	Arg	Pro	Pro	Pro	Gly	Ser	Arg	Pro	Val	Ser
			180					185					190		
Gln	Pro	Cys	Cys	Arg	Pro	Thr	Arg	Tyr	Glu	Ala	Val	Ser	Phe	Met	Asp
		195					200					205			
Val	Asn	Ser	Thr	Trp	Arg	Thr	Val	Asp	Arg	Leu	Ser	Ala	Thr	Ala	Cys
	210					215					220				
Gly	Cys	Leu	Gly												
225															

<210> 12
 <211> 232
 <212> PRT

<220>

<223> Xaa in any position can be any amino acid residue.
Xaa in position 19, 20, 21, 22, 23, 24, 25, 26,
109, 110, 111 or 112 may be absent or present.

$\langle 220 \rangle$

<223> Description of Artificial Sequence:Consensus Sequence

<400> 12

Met 1	Glu	Leu	Gly	Leu 5	Xaa	Xaa	Xaa	Xaa	Xaa 10	Leu	Ser	His	Cys	Xaa 15	Xaa
Pro	Arg	Xaa	Xaa 20	Xaa	Xaa	Xaa	Xaa	Xaa 25	Xaa	Xaa	Gln	Xaa	Ala 30	Xaa	Trp
Pro	Thr	Leu 35	Ala	Xaa	Leu	Ala	Leu 40	Leu	Ser	Xaa	Val	Xaa 45	Glu	Ala	Ser
Leu	Xaa 50	Xaa	Xaa	Xaa	Arg	Ser 55	Pro	Ala	Xaa	Arg	Xaa 60	Gly	Pro	Xaa	Pro
Val 65	Leu	Ala	Xaa	Pro	Xaa 70	Xaa	His	Leu	Pro	Gly 75	Gly	Xaa	Thr	Ala	Xaa 80
Xaa	Cys	Ser	Xaa	Arg 85	Xaa	Xaa	Arg	Pro	Pro 90	Pro	Gln	Xaa	Xaa	Xaa 95	Pro
Ala	Pro	Pro	Pro 100	Pro	Xaa	Pro	Xaa	Xaa 105	Xaa	Xaa	Pro	Xaa	Xaa 110	Xaa	Xaa
Arg	Gly	Xaa 115	Arg	Ala	Ala	Arg	Ala 120	Gly	Xaa	Xaa	Xaa 125	Ser	Arg	Ala	Arg
Xaa 130	Xaa	Xaa	Ala	Arg	Gly	Cys 135	Arg	Leu	Arg	Ser	Gln 140	Leu	Val	Pro	Val
Xaa 145	Ala	Leu	Gly	Leu	Gly 150	His	Xaa	Ser	Asp	Glu 155	Leu	Xaa	Arg	Phe	Arg 160
Phe	Cys	Ser	Gly	Ser 165	Cys	Arg	Arg	Ala	Arg 170	Ser	Xaa	His	Asp	Leu 175	Ser
Leu	Ala	Ser	Leu 180	Leu	Gly	Ala	Gly	Ala 185	Leu	Arg	Xaa	Pro	Pro 190	Gly	Ser
Arg	Pro	Xaa 195	Ser	Gln	Pro	Cys	Cys 200	Arg	Pro	Thr	Arg	Tyr 205	Glu	Ala	Val
Ser	Phe 210	Met	Asp	Val	Asn	Ser 215	Thr	Trp	Arg	Thr	Val 220	Asp	Xaa	Leu	Ser
Ala 225	Thr	Ala	Cys	Gly	Cys 230	Leu	Gly								